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Conservation of Greater Sage-Grouse on Public Lands in the Western U.S.: Implications of Recovery and Management Policies

Executive Summary

Based on current research, what are the best set of policy alternatives for maintaining and increasing greater sage-grouse (*Centrocercus urophasianus*) populations on public lands that policy makers could implement and expect some results within a three- to five-year time frame? Why is such a policy study needed at this time? First, we see a need for a set of alternatives that will create a positive effect as soon as possible to provide a foundation for longer-term recovery plans. Second, recent submission of range-wide Endangered Species Act (ESA) petitions to list sage-grouse on the Endangered Species list is accelerating the recovery policy process. Agencies, organizations and individuals are or may soon be taking broad and potentially disruptive management actions related to sage-grouse recovery that may or may not be justified either by population conditions or by an adequate knowledge of the habitat requirements needed to maintain or recover populations.

Policy Question

Our policy question is this: "What actions can be taken on public lands to maintain and enhance sage-grouse populations where they currently exist and to restore populations on rangelands where they formerly existed?"

Policy Criteria

We begin our systematic evaluation by presenting two criteria for evaluating current and future policy decisions: a description of sage-grouse population characteristics, and a description of sage-grouse habitat needs across seasons.

- Both breeding populations and reproductive rates were declining over the long term. Efforts to expand and insure accurate counts of the total population of grouse are crucial because they determine, in a sense, how much time is available to develop and implement management actions to help the bird recover.
- The seasonal habitat needs discussed in this section are summarized in Table 1. The relationship of sage-grouse to their seasonal habitats is generally well understood, especially with regard to sagebrush characteristics necessary to support sage-grouse populations. Researchers and managers should recognize the dynamic nature of the sagebrush biome and realize that sites may vary widely in biological potential. Although sage-grouse maintain a dependence on sagebrush habitats year-long, many researchers believe that spring is the most vital season to insure sage-grouse welfare. This is the case because the bird's dependence on sagebrush habitats increases during spring to include requirements for breeding, nesting, and rearing of young.

Variables to Evaluate Policy Criteria

The general policy variables, or "alternatives," are realistic actions that, with scientific foundations related to the needs of the grouse and the sagebrush system, can be taken under current circumstances to help stabilize grouse populations and habitat. We are often left to conclude that policies have little or no research to support them, or the available evidence does not point to a certain conclusion: our conclusion means that and only that. The question remains open and adequate research is yet to be conducted. A policy alternative that lacks research support is not right or wrong and justification for it must then be made on other grounds.

- **Fire:** To our knowledge, there is no empirical evidence supporting the notion that fire has positive effects on sage-grouse over the short or long term. Fire removes large sagebrush plants that provide thermal and security cover and food, and reduces important insect populations vital to sage-g≤ouse diets. Fire tends to burn the most productive grouse habitats within an area — where grasses and forb cover are greatest — leaving unburned, less productive sites of inferior habitat value.
- **Maintaining and Protecting Habitat:** Extensive sagebrush stands have been removed or

thinned, as a matter of public policy, for the express purpose of altering the plant communities in those systems. A frequent assumption underlying treatments of sagebrush communities is that canopy cover is too high and should be subject to control measures. However, documented sagebrush canopy cover values in sage-grouse breeding habitats range from 15 to 38%. Millions of acres of historical sagebrush habitats have been lost to cultivation, urban development and other habitat conversions making the remaining acres of sagebrush critically important to the sage-grouse. Existing sagebrush habitats should be viewed as currently or potentially useable by sage-grouse, and, therefore, the retention of sagebrush habitats should be a high priority for all management agencies.

- **Invasive Plant Species:** Invasive (exotic or introduced) plants are a negative influence on long-term productivity of otherwise native ecosystems, largely because they alter the natural composition of habitats, which in turn negatively affect organisms, such as sage-grouse, that rely on the native plants that were replaced by the invasive species. Large increases in annual exotics at the lower elevations and conversion of shrub-steppe habitat to woodlands at the upper elevations has had a major impact on sage-grouse populations.
- **Physical Changes in Habitat:** Physical changes not only fragment habitats and reduce habitat patch size, but also some (i.e., power lines, roads, reservoirs, fences) are known sources of direct and indirect mortality.
- **Predation:** There is little published information supporting the notion that predation is a widespread limiting factor on sage-grouse populations. That which is available largely suggests that high predation rates result from poor habitat and/or non-native predators. No defensible studies of the ecological implications of removing and/or controlling the number of predators that prey on sage-grouse have been conducted.
- **Hunting:** While most wildlife agencies have reduced sage-grouse harvest rates, a recommended harvest level has not been universally accepted, and may not be appropriate for all sage-grouse populations. There are no available data to suggest that harvest of sage-grouse is a major cause of declining populations, but caution is warranted given the status of most populations.
- **Inventory and Monitoring:** Inventory and monitoring considerations for sage-grouse include landscape analyses aInventory and monitoring considerations for sage-grouse include landscape analyses and evaluation of site condition and potential. Resulting management efforts for sage-grouse should be, to a great extent, consistent with efforts to sustain the integrity of sagebrush systems if specific seasonal habitat requirements of sage-grouse are considered (e.g. minimal patch sizes, absence of transportation corridors). Inventory and monitoring efforts are the foundation of any potentially successful recovery plans.
- **Livestock Grazing:** Overall, most of the research on sage-grouse habitat needs took place, and continues to take place, on habitats that are grazed. We can see from the range of data that grouse and grazing coexist in many, if not most, areas so we know with reasonable certainty that grouse and livestock are not mutually exclusive. There are few scientific, peer-reviewed articles that address the grazing and sage-grouse issue — none that are designed experiments, and none with replicates. Most of what is available reflects conclusions or thoughts without empirical data, or it represents gray literature. Our general opinion is that any argument that livestock grazing presently is or is not the primary cause of sage-grouse population decline cannot be supported by available research. In the long run, ranchers and the communities in which they live need to make some difficult and complex decisions about how to achieve the mix of vegetative characteristics that best support sage-grouse population growth.
- **Social Issues:** The nature and extent of social impacts are determined, to a great extent, by those to whom you are talking. In our opinion, impacts are most likely to fall on those whose lives are intertwined most closely with public lands policies on a daily basis: public land ranchers. The second group is likely to be rural communities in general. Not only do they feel the impacts through ranchers, but also hunters and localized fiscal impacts on other economic activities like energy development, road building, etc. The cumulative effect on local communities more or less account for most of the local impacts. Environmentalists, developers, energy companies and others will escape the local impacts, but experience there own positive or negative impacts elsewhere. None of the management policies for protecting the sage-grouse suggested in this report appear to have serious negative social impacts for local rural communities. However, social conflict can increase in these communities, reducing cohesion among groups in the communities, thus making it more difficult for communities to act together and achieve their desired objectives.
- **Economics of Livestock Grazing:** Due to its importance to sage-grouse nesting and brooding success, we analyzed the economic implications of reductions or elimination of spring grazing on federal lands in three western counties. Various ranches will be able to substitute alternative forages to varying degrees as federal AUMs are eliminated.

Substituting forages always minimized economic losses relative to the option of feeding hay and reducing brood cow herd size. Economic losses from removing federal forage ranged from $2.50/AUM for the Jordan Valley, Idaho model, $5.50/AUM for the Northeastern Nevada model, to nearly $20/AUM for the Lake County, Oregon model. The contributory value of public land grazing permits for livestock production varies widely depending on the seasonal complement of forage and pasture resources, and the level of dependency on federal lands.

Conclusion

Stabilizing sage-grouse populations across the West will involve setting priorities in the short and long run. Our conclusions are based on an evaluation of the available scientific literature on both the organism and its habitat. Here we suggest actions that we think will give land management agencies the most impact in the shortest time. In general, the suggested actions should be employed throughout the sage-grouse range to provide a firm foundation for sage-grouse conservation.